**3GPP TSG-RAN WG2 Meeting #117-e *R2-22xxxxx***

**Electronic, 21st Feb – 3rd Mar 2022**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.300** | **CR** | **0420** | **rev** | **1** | **Current version:** | **16.8.0** |  |
|  | | | | | | | | |
| *For* [***HELP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | Introduction of DL 1024 QAM in NR | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson, Nokia, Nokia Shanghai Bell | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_DL1024QAM\_FR1-Core | | | | |  | ***Date:*** | | | 2022-02-14 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | In the RAN1#104-e meeting, RAN1 concluded its work for the introduction of 1024 QAM in NR and an LS was sent to RAN2 in R2-2102619. Here, RAN1 informed RAN2 and RAN4 about the following agreements:   * Introduce new RRC signaling to indicate use of 1024-QAM MCS table for at least DCI format 1\_1   + FFS : support of 1024-QAM MCS table for DCI format 1\_2     - Note: If 1024-QAM MCS table for DCI format 1\_2 is supported, separate RRC signaling is used for each of the two DCI formats 1\_1 and 1\_2, respectively   + FFS : whether the RRC signaling is only introduced in PDSCH-Config or it can also be separately configured in SPS-Config * RRC signaling (mcs-Table-r17) to indicate use of 1024-QAM MCS table for DCI format 1\_1 is present only in PDSCH-config * Introduce new RRC signaling to indicate use of 1024-QAM CQI table. * Introduce separate RRC signaling to indicate use of 1024-QAM MCS table for DCI format 1\_2.   These should be then reflected in the RAN2 specifications. | | | | | | | | |
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| ***Summary of change:*** | | Section 5.2.2  - Clarify that modulation on physical layer can also be 1024QAM | | | | | | | | |
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| ***Consequences if not approved:*** | | The 1024 QAM for DL will not be captured as allowed in Stage-2 . | | | | | | | | |
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| ***Clauses affected:*** | | 5.2.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 38.331 CR 2940 | | |
| ***affected:*** | |  |  | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  |  | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

*START OF CHANGES*

### 5.2.2 Physical-layer processing for physical downlink shared channel

The downlink physical-layer processing of transport channels consists of the following steps:

- Transport block CRC attachment;

- Code block segmentation and code block CRC attachment;

- Channel coding: LDPC coding;

- Physical-layer hybrid-ARQ processing;

- Rate matching;

- Scrambling;

- Modulation: QPSK, 16QAM, 64QAM, 256QAM, and 1024QAM;

- Layer mapping;

- Mapping to assigned resources and antenna ports.

The UE may assume that at least one symbol with demodulation reference signal is present on each layer in which PDSCH is transmitted to a UE, and up to 3 additional DMRS can be configured by higher layers.

Phase Tracking RS may be transmitted on additional symbols to aid receiver phase tracking.

The DL-SCH physical layer model is described in TS 38.202 [20].

*END OF CHANGES*